10: Sampling Distributions with StatKey

Stat 120 | Fall 2025

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> No R needed today! We'll focus on concepts and intuition with StatKey

1. Use StatKey's **mean** menu: https://www.lock5stat.com/StatKey/sampling_1_quant/sampling_1_quant.html and select "Percent with internet access 3e (countries)". Click "Show data table".

(a) What is each case?
(b) What is each variable?
(c) Do you think this dataset represents a population or a sample?
(d) Close the dataset viewer. Click "Generate 10 samples". What does each dot represent?
(e) What happens to the shape, center, and spread of the sampling distribution as n increases? (You can use "Generate 1000 samples" to speed this up)
(f) Is there a number of samples where the distribution doesn't change much?

2. Use StatKey's **proportion** menu: https://www.lock5stat.com/StatKey/sampling_1_cat/sampling_1_cat.html to answer the following. (a) Click the "edit proportion" button to change the population parameter p

(a) Choose a value of p that is between .2 and .8. Describe how the shape, center, and spread of the sampling distribution changes as n increases
(b) Describe how the shape, center, and spread of the sampling distribution changes as p gets closer to 1

3. About 10% of the worldwide population is left-handed. A 200-seat lecture hall has been built with 15 rows (the number of seats in each row varies). Each row has a single "lefty seat" that has the built-in desk on the left rather than the right arm of the chair. In a class of 90 students, what's the probability that there will not be enough seats for the left-handed students?

(a) What number of left-handed students would have to be in the class for there to not be enough desks?
(b) Set up the sampling distribution using StatKey. What is p and n?
(c) Simulate 1000 samples. Use the results to estimate the probability.

(d) Now suppose there's a class of 50 instead. Do you think this probability will be higher, lower, or about the same as (d)?
(e) Use StatKey to estimate the probability in (d). Are you surprised?

4. Explain the difference between (1) the distribution of a population, (2) the distribution of a sample, (3) the sampling distribution. Be sure to fill in these definitions in your note sheet.

When you're done, submit the answers to number 3 on gradescope. You only need to submit 1 per group.